

Claims

1. Method for fault detection in a power transformer/-  
autotransformer and/or interconnected power lines that are  
5 within a zone protected by a differential protection, the  
method being particularly suitable for detecting turn-to-  
turn faults in power transformer/autotransformer windings  
and including measuring all individual instantaneous phase  
currents of the protected object and calculating individual  
10 phase currents as fundamental frequency phasors,

**the method comprising,**

- calculating the contributions of the individual protected  
object sides negative sequence currents to the total  
negative sequence differential current by compensating for  
15 the phase shift of the power transformer within the  
protected zone,
- comparing the relative positions of the compensated  
individual sides negative sequence currents in the complex  
plane, in order to determine whether the source of the  
20 negative sequence currents, i.e. the fault position, is  
within the protected zone or outside of the protected zone,  
delimited with current transformer locations,
- disconnecting the protected object if determined that the  
source of the negative sequence currents is within the  
25 protected zone.

2. Device for detecting a fault in a power transformer,  
autotransformer or interconnected power lines, that are  
within a zone protected by a differential protection, and  
30 particularly suitable for detecting turn-to-turn faults in  
power transformer/autotransformer windings, comprising  
means for measuring all individual instantaneous phase

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currents of the protected object, and means for calculating individual phase currents as fundamental frequency phasors, **characterized by,**

- means for calculating the contributions of the individual  
5 protected object sides negative sequence currents to the total negative sequence differential current by compensating for the phase shift of an eventual power transformer within the protected zone,
- means for comparing the relative positions of the  
10 compensated individual sides negative sequence currents in the complex plane, in order to determine whether the source of the negative sequence currents, i.e. the fault position, is within the protected zone or outside of the protected zone, delimited with current transformer locations,
- 15 - means for disconnecting the protected object if determined that the source of the negative sequence currents is within the protected zone.

3. Device according to claim 2,  
20 **characterized by that,**

a fault discriminator is included, that is arranged to determine when a fault occurs.

4. Device according to claim 2 or 3,  
25 **characterized by that,**

a fault discriminator is included, that is arranged to determine if the fault is internal or external.

5. A computer program comprising computer program code means  
30 for carrying out the steps of a method according to claim 1.

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6. A computer readable medium comprising at least part of a computer program according to claim 4.

7. A computer program, according to claim 4, that is, at  
5 least partially, provided through a network, such as e.g. internet.